REMARKS

INTRODUCTION

Claims 23-27 have been withdrawn from consideration.

Claims 1-22 and 28-55 were previously pending and rejected.

Claims 1, 2, 29, 30 and 34 have been amended.

Claims 56 and 57 have been added.

Claims 1-22 and 28-57 are now pending and under consideration.

No new matter is being presented, and approval and entry are respectfully requested.

INTERVIEW

Applicant thanks the Examiner for the Interview of December 18, 2002. At the Interview the Examiner explained that the present application would likely be advanced if structural aspects of the present invention were clarified. This Amendment provides such clarification. To further aid advancement of the present application, Applicant respectfully requests the Examiner to particularly identify any portions of the claims that are deemed to not have patentable weight.

EXAMINATION OF ARGUMENTS AND FUNCTIONAL RECITATIONS REQUESTED

During the Interview, the Examiner stated that the claims are unpatentable because they lack structural limitations. Applicant respectfully notes that an "[a]pplicant may use functional language" (MPEP § 2173.01). Furthermore, MPEP § 2173.05(g) states that:

> There is nothing inherently wrong with defining some part of an invention in functional terms. ... **A functional limitation must be evaluated and considered,** just like any other limitation of the claim, for what it fairly conveys to a person of ordinary skill in the pertinent art in the context in which it is used. A functional limitation is often used in association with an element, ingredient, or step of a process to define a particular capability or purpose that is served by the recited element, ingredient or step.

Additionally, the MPEP at § 707.07(f) requires that "[w]here the applicant traverses any rejection, the examiner should, if he or she repeats the rejection, **take note of the applicant's**

argument and answer the substance of it." Although the Office Action states that Applicant's arguments were moot in view of "new rejections", the latest rejections are not new; they are repetitions of the previous rejections. Most of Applicant's arguments were based on independent claims whose rejection did not change. The latest rejections were not new, and did not take not of the Applicant's arguments or answer their substance. Furthermore, arguments relating to claims 14 and 15 were not answered.

The Examiner is respectfully requested to fully evaluate and consider all new and previous arguments and all features of the claims, including those deemed to be functional in nature.

PRESENT INVENTION

The present invention achieves a greater range of color reproduction than was previously possible with Plasma Display Panels (PDPs). In one aspect, the present invention uses a filter that absorbs undesirable red light generated by a discharge gas and also absorbs desirable red light of a red phosphorescent element. The filter may be combined with an increased emission of the red phosphorescent element, thus compensating the attenuation by the filter of the desired red light.

In another aspect, the intensity of light emitted by the red element can be increased, relative to the other elements (for example, by a structural difference). Thus, the contribution of the discharge gas light to the final emission of the display is reduced while the relative contribution of the red element is maintained.

Stated another way, a feature of the present invention is that a filter absorbs the undesirable component of light generated by a discharge gas, and the intensity of desirable component light emitted by fluorescent bodies is adjusted to compensate for the attenuation of the desirable component light absorbed by the filter. Various filters are known in the art. However, none of the cited references discloses adjustment of intensity of light emitted by fluorescent bodies for compensating for attenuation of light absorbed by the filter.

NEW CLAIMS 56 AND 57

New claims 56 and 57 have been added to clarify an aspect of the present invention. Applicant respectfully suggests that if features of these new claims are deemed patentable, then Applicant's representative is available to discuss possible amendments of the other claims in

view thereof.

REJECTIONS UNDER 35 USC § 112, SECOND PARAGRAPH

In the Office Action, at pages 2-3, claims 2-9, 28, 30 and 34-54 were rejected under 35 U.S.C. § 112, second paragraph, for the reasons set forth therein. The Examiner alleged that the claim recitation "larger/less than would be necessary to reproduce the whitish color intended for display" was not clear. The rejection proposes that it is unclear what would be necessary to reproduce the whitish color intended for display.

Each of the rejected claims recites what is necessary to reproduce the color. For example, claim 2 recites "a light-emission intensity of the first display element is higher than would be necessary to reproduce the whitish color to be displayed by using a combined light emission of the first to third display elements that is not received by said filter". One skilled in the art would understand that the intensity of the first display element would be higher than an intensity necessary to reproduce the whitish color without the filter. If a feature is deemed unclear, the MPEP requires that it nonetheless must be examined.

Withdrawal of the rejection is respectfully requested.

PRIOR ART: UEOKA

With Ueoka, because the intensity of light emitted by fluorescent bodies is not adjusted, the intensity of light emitted by a red phosphorous element and thus color balance is lost when a filter is used to absorb the color of light generated by the discharge gas.

REJECTIONS UNDER 35 USC § 103

In the Office Action, the claims were rejected under 35 U.S.C. § 103 as being unpatentable over primary reference Ueoka et al., in view of various secondary references, including Asano et al. This rejection is traversed and reconsideration is requested.

CLAIMS DISTINGUISHABLE FROM UEOKA

As discussed above, one aspect of the present invention is that the intensity of light emitted by a fluorescent element is set, adjusted, constructed, etc. to provide an intensity of desirable filtered light that sufficiently compensates for the attenuation of the filter. In Ueoka, because the intensity of light emitted by fluorescent bodies is not adjusted, the intensity of light emitted by a specific fluorescent body weakens and thus color balance is lost if a filter is

disposed to absorb the color of light generated by the discharge gas. No reference has been cited as teaching an element or emission with an increased intensity, relative to the other elements or emissions, to compensate for the attenuation thereof.

Claim 1 recites "the first fluorescent element producing an intensity of the first color that exceeds the prescribed intensity thereof, relative to the second and third intensities, required to provide the whitish second color".

Claim 28 recites "a light-emission intensity of at least one of the fluorescent substances is set to be larger than would be necessary to display an intended white light by simultaneous unfiltered light emission of the fluorescent substances, so that light within the wave range is emitted with intensity to compensate for attenuation of light within the wave range absorbed by the filter".

Claim 34 recites "a filter having a characteristic of absorbing light within a wave range of visible light emitted by the discharge gas, ... wherein a light-emission intensity of at least one of the fluorescent substances is set to be larger than would be necessary to display an intended white light by simultaneous unfiltered light emission of the fluorescent substances, so that light within the wave range is emitted with intensity sufficient to compensate for attenuation of light within the wave range absorbed by the filter".

Withdrawal of the rejection is respectfully requested.

PRESENT INVENTION UNOBVIOUS

The presently claimed invention is inherently not obvious to one skilled in the art. For instance, filtering the undesirable red discharge light would be expected to adversely affect the desirable emission of a red element which it partly overlaps. In displays using a discharge gas, the intensity of the emitting elements has generally been controlled by regulating the intensity of the discharge gas. However, simply increasing the intensity of the discharge gas emission to increase the intensity of the element would defeat the purpose of the filter, because the filter then may not sufficiently eliminate the higher-intensity undesirable discharge gas light.

The present invention combines at least two novel observations. First, discharge gas light may be selectively filtered or attenuated. For example, discharge gas light may be filtered more than the light of a similarly colored element such as a red element. Second, the intensity of that element, relative to the other elements, may be increased without necessarily increasing the intensity of the discharge light (e.g. a structural difference may be used to cause greater

emission by the element without increasing the intensity of the undesirable discharge light).

DEPENDENT CLAIMS

The dependent claims are deemed patentable due at least to their dependence from allowable independent claims. These claims are also patentable due to their recitation of independently distinguishing features. For example, claim 2 recites "the filter selectively attenuates by [partially blocks] attenuating the light emitted by the first element relatively more than it attenuates the light emitted by the second and third element." This feature is not taught or suggested by the prior art. Withdrawal of the rejection of the dependent claims is respectfully requested.

CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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on January 29, 2003

STAAS & HALSEY

By: Patricia A. Anderson

Date: January 29, 2003

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS:

Please AMEND the claims in accordance with the following:

1. (THREE TIMES AMENDED) A gas discharge display device for displaying a color image, comprising:

first, second and third fluorescent [substances] elements having different emission colors, wherein said first, second, and third fluorescent [substances] elements are set to emit before selective attenuation by a filter, first, second, and third component emissions with respective first, second, and third intensities, in combination producing [a] an unfiltered first color that is warmer than a whitish second color, where the whitish second color is [when] a color to be finally displayed after selective attenuation by the filter according to prescribed intensities of the first, second, and third component emissions, and where the first color comprises an undesirable discharge gas emission [using the display device is the whitish color];

the first fluorescent element producing an intensity of the first color that exceeds the prescribed intensity thereof, relative to the second and third intensities, required to provide the whitish second color; and

[a] the filter to receive the emitted first color that is warmer than the whitish second color, and adjusting the warmer first color to the whitish second color by selectively attenuating to a visually insignificant level light in an emission wavelength region of the discharge gas.

2. (TWICE AMENDED) The gas discharge display device of claim 1, wherein

a structural dimension of a first display element corresponding to said first fluorescent substance is different from structural dimensions of second and third display elements corresponding to said second and third fluorescent substances,

wherein the filter selectively attenuates by [partially blocks] attenuating the light emitted by the first element relatively more than it attenuates the light emitted by the second and third element, and

a light-emission intensity of the first display element is higher than would be necessary to reproduce the whitish color to be displayed by using a combined light emission of the first to third display elements that is not received by said filter.

3. (AS TWICE AMENDED) The gas discharge display device of claim 2, wherein

each of the display elements comprises a pair of electrodes to generate an electric discharge between the electrodes to allow the fluorescent substances to emit light, and

the dimension condition is a surface area of the electrodes.

4. (AS TWICE AMENDED) The gas discharge display device of claim 3, wherein the surface area of the electrodes in the first display element is larger than a surface area that would be necessary to reproduce the whitish color intended for display by using the combined light emission of the first through third display elements that is not received by said filter.

5. (AS TWICE AMENDED) The gas discharge display device of claim 2, wherein

each of the display elements comprises a pair of electrodes to generate electric discharge between the electrodes to allow the fluorescent substances to emit light, and

the dimension condition of each display element is an area of a light-emission region of the fluorescent substance.

6. (AS TWICE AMENDED) The gas discharge display device of claim 5, wherein the area of the light-emission region of the fluorescent substance comprises a fluorescent substance layer in the first display element that has an area that is larger than what would be necessary to reproduce the whitish color intended for display by using a combined light emission of the display elements that is not received by said filter.

7. (AS TWICE AMENDED) The gas discharge display device of claim 2, wherein

each of said display elements comprises

a pair of electrodes to generate an electric discharge between the electrodes to allow the fluorescent substances to emit light, and

dielectric substance layers that cover the respective electrodes, and

the structural dimension is a thickness of the respective dielectric layers.

8. (AS TWICE AMENDED) The gas discharge display device of claim 7, wherein the thickness of the dielectric substance layers in said first display element is less than what would be necessary to reproduce the whitish color intended for display by using a combined light emission of the display elements that is not received by said filter.

9. (AS TWICE AMENDED) The gas discharge display device of claim 1, wherein a light-emission intensity of a first display element corresponding to said first fluorescent substance is higher than an intensity that would be necessary to reproduce the whitish color intended for display by using a combined light-emission of first through third display elements corresponding to said first to third fluorescent substances that is not received by said filter.

10. (AS ONCE AMENDED) The gas discharge display device of claim 1, wherein said filter has a color correction function for increasing a color temperature value.

11. (AS ONCE AMENDED) The gas discharge display device of claim 1, wherein said filter attenuates an intensity of light in a red wavelength region.

12. (AS ONCE AMENDED) The gas discharge display device of claim 1, wherein said filter has a characteristic such that an average transmissivity of light in a green wavelength region is lower than an average transmissivity of light in a blue wavelength region, and higher than an average transmissivity of light in a red wavelength region.

13. (AS ONCE AMENDED) The gas discharge display device of claim 1, wherein within a red wavelength region, said filter has a characteristic such that a transmissivity of a longer wavelength is higher than a transmissivity of a shorter wavelength.

14. (AS ONCE AMENDED) The gas discharge display device of claim 1, wherein said filter has a characteristic such that a wavelength providing the lowest transmissivity has a value within a range of 560 to 610 nanometers.

15. (AS ONCE AMENDED) The gas discharge display device of claim 1, wherein said filter has a characteristic such that absorption peaks appear at least in a wavelength region of 470 to 520 nanometers and in a wavelength region of 560 to 610 nanometers.

16. (AS ONCE AMENDED) The gas discharge display device of claim 1, further comprising a pair of substrates for forming a discharge space therebetween, and wherein said filter is formed directly on an inner or outer surface of one of said substrates that constitutes a display surface.

17. (AS ONCE AMENDED) The gas discharge display device of claim 1, further comprising a display panel having a discharge space therein with arranged display elements, and wherein said filter is fabricated separately from said display panel and disposed on a front side of said display panel.

18. (AS ONCE AMENDED) The gas discharge display device of claim 1, further comprising a display panel having a discharge space therein with arranged display elements and a transparent protection plate for protecting a display surface of said display panel, and wherein said filter is disposed on an inner or outer surface of the protection plate.

19. (AS TWICE AMENDED) The gas discharge display device of claim 1, wherein said filter is a pigment filter.

20. (AS TWICE AMENDED) The gas discharge display device of claim 1, wherein said filter is a multi-layer film filter.

21. (AS ONCE AMENDED) The gas discharge display device of claim 1, wherein said first fluorescent substance is a fluorescent substance for red composed essentially of (Y, Gd) B03 : Eu, said second fluorescent substance is a fluorescent substance for green composed essentially of Zn2Si04 : Mn, and said third fluorescent substance is a fluorescent substance for blue composed essentially of BaMgA110017 : Eu.

22. (AS ONCE AMENDED) The gas discharge display device of claim 1, further comprising a discharge space filled with a Penning gas composed essentially of neon and xenon as a discharge gas.

28. (AS ONCE AMENDED) A gas discharge display device using a plasma display panel, comprising:

a plurality of discharge cells formed within a discharge space between a front substrate and a rear substrate, each of the discharge cells including a discharge gas therein and being provided with one of fluorescent substances of first, second, and third fluorescent substances selected to emit light for performing color display; and

a filter having a characteristic of absorbing light within a wave range of visible light emitted by the discharge gas, the filter being disposed on a front side of the front substrate, wherein a light-emission intensity of at least one of the fluorescent substances is set to be larger than would be necessary to display an intended white light by simultaneous unfiltered light emission of the fluorescent substances, so that light within the wave range is emitted with intensity to compensate for attenuation of light within the wave range absorbed by the filter.

29. (TWICE AMENDED) A display apparatus for displaying a target color, comprising:

a pixel comprising a first, second, and third cell, each cell comprising a discharge gas and a substance, where the discharge gas emits a discharge light that enters the substance of the cell causing the substance to emit an emission light, whereby each cell emits a color that is a combination of the discharge light and the emission light of the cell, and wherein the color of each cell is different from that of the other cells; [and]

a filter attenuating the discharge gas light of the first, second and third cells more than it attenuates the emission light of the first cell; and

the emission light of the first cell is attenuated by the filter more than the emission light of the second and third cells, the first cell being constructed to emit its emission light with an increased intensity sufficient to compensate for its attenuation by the filter and thereby causing the filter to produce the target color.

30. (ONCE AMENDED) The apparatus of claim 29, wherein the [color emitted by the] first cell is constructed to have [an] the increased intensity greater than necessary to reproduce, in combination with the unfiltered color emitted by the second and third cells, the target light.

31. (AS UNAMENDED) A display apparatus, comprising:

a discharge gas emitting a discharge light that includes a first red light;

a cell of a pixel having a substance that, in response to being irradiated by the discharge light, emits a second red light; and

a filter attenuating the first red light more than it attenuates the second red light.

32. (AS UNAMENDED) The apparatus of claim 31, wherein the intensity of the second red light is increased in proportion to its attenuation by the filter.

33. (AS UNAMENDED) The apparatus of claim 32, wherein the intensity of the second red light is increased by modifying a physical dimension of the cell, which includes a physical dimension of the substance of the cell.

34. (ONCE AMENDED) A gas discharge display device comprising:

a plurality of discharge cells formed within a discharge space between a front substrate and a rear substrate, the discharge cells including a discharge gas therein and being provided with first, second, and third fluorescent substances of red, green and blue, the fluorescent substances being selected to emit light for performing color display; and

a filter having a characteristic of absorbing light within a wave range of visible light emitted by the discharge gas, the filter being disposed on a front side of the front substrate, wherein a light-emission intensity of at least one of the fluorescent substances is set to be larger than would be necessary to display an intended white light by simultaneous unfiltered light emission of the fluorescent substances, so that light within the wave range is emitted with intensity sufficient to compensate for attenuation of light within the wave range absorbed by the filter.

35. (AS UNAMENDED) The gas discharge display device of claim 34, wherein

a structural dimension of a first display element corresponding to said first fluorescent substance is different from structural dimensions of second and third display elements corresponding to said second and third fluorescent substances,

wherein the filter partially blocks the light emitted by the first element, and

a light-emission intensity of the first display element is higher than would be necessary to reproduce the whitish color to be displayed by using a combined light emission of the first to third display elements that is not received by said filter.

36. (AS UNAMENDED) The gas discharge display device of claim 35, wherein

each of the display elements comprises a pair of electrodes to generate an electric discharge between the electrodes to allow the fluorescent substances to emit light, and

the dimension condition is a surface area of the electrodes.

37. (AS UNAMENDED) The gas discharge display device of claim 36, wherein the surface area of the electrodes in the first display element is larger than a surface area that would

be necessary to reproduce the whitish color intended for display by using the combined light emission of the first through third display elements that is not received by said filter.

38. (AS UNAMENDED) The gas discharge display device of claim 35, wherein

each of the display elements comprises a pair of electrodes to generate electric discharge between the electrodes to allow the fluorescent substances to emit light, and

the dimension condition of each display element is an area of a light-emission region of the fluorescent substance.

39. (AS UNAMENDED) The gas discharge display device of claim 38, wherein the area of the light-emission region of the fluorescent substance comprises a fluorescent substance layer in the first display element that has an area that is larger than what would be necessary to reproduce the whitish color intended for display by using a combined light emission of the display elements that is not received by said filter.

40. (AS UNAMENDED) The gas discharge display device of claim 35, wherein

each of said display elements comprises

a pair of electrodes to generate an electric discharge between the electrodes to allow the fluorescent substances to emit light, and

dielectric substance layers that cover the respective electrodes, and

the structural dimension is a thickness of the respective dielectric layers.

41. (AS UNAMENDED) The gas discharge display device of claim 40, wherein the thickness of the dielectric substance layers in said first display element is less than what would be necessary to reproduce the whitish color intended for display by using a combined light emission of the display elements that is not received by said filter.

42. (AS UNAMENDED) The gas discharge display device of claim 34, wherein a light-emission intensity of a first display element corresponding to said first fluorescent substance is higher than an intensity that would be necessary to reproduce the whitish color intended for display by using a combined light-emission of first through third display elements corresponding to said first to third fluorescent substances that is not received by said filter.

43. (AS UNAMENDED) The gas discharge display device of claim 34, wherein said filter has a color correction function for increasing a color temperature value.

44. (AS UNAMENDED) The gas discharge display device of claim 34, wherein said filter attenuates an intensity of light in a red wavelength region.

45. (AS UNAMENDED) The gas discharge display device of claim 34, wherein said filter has a characteristic such that an average transmissivity of light in a green wavelength region is lower than an average transmissivity of light in a blue wavelength region, and higher than an average transmissivity of light in a red wavelength region.

46. (AS UNAMENDED) The gas discharge display device of claim 34, wherein within a red wavelength region, said filter has a characteristic such that a transmissivity of a longer wavelength is higher than a transmissivity of a shorter wavelength.

47. (AS UNAMENDED) The gas discharge display device of claim 34, wherein said filter has a characteristic such that a wavelength providing the lowest transmissivity has a value within a range of 560 to 610 nanometers.

48. (AS UNAMENDED) The gas discharge display device of claim 34, wherein said filter has a characteristic such that absorption peaks appear at least in a wavelength region of 470 to 520 nanometers and in a wavelength region of 560 to 610 nanometers.

49. (AS UNAMENDED) The gas discharge display device of claim 34, further comprising a pair of substrates for forming a discharge space therebetween, and wherein said filter is formed directly on an inner or outer surface of one of said substrates that constitutes a display surface.

50. (AS UNAMENDED) The gas discharge display device of claim 34, further comprising a display panel having a discharge space therein with arranged display elements, and wherein said filter is fabricated separately from said display panel and disposed on a front side of said display panel.

51. (AS UNAMENDED) The gas discharge display device of claim 34, further comprising a display panel having a discharge space therein with arranged display elements and a transparent protection plate for protecting a display surface of said display panel, and wherein said filter is disposed on an inner or outer surface of the protection plate.

52. (AS UNAMENDED) The gas discharge display device of claim 34, wherein said filter is a pigment filter.

53. (AS UNAMENDED) The gas discharge display device of claim 34, wherein said filter is a multi-layer film filter.

54. (AS UNAMENDED) The gas discharge display device of claim 34, wherein said first fluorescent substance is a fluorescent substance for red composed essentially of (Y, Gd) B03 : Eu, said second fluorescent substance is a fluorescent substance for green composed essentially of Zn2Si04 : Mn, and said third fluorescent substance is a fluorescent substance for blue composed essentially of BaMgA110017 : Eu.

55. (AS UNAMENDED) The gas discharge display device of claim 34, further comprising a discharge space filled with a Penning gas composed essentially of neon and xenon as a discharge gas.

56. (NEW) A color display apparatus performing a gaseous discharge producing an undesired gaseous red component emission, and also producing phosphorescent red, blue, and green component emissions of respective and different peak emission values at corresponding, different wavelengths, respective prescribed first, second, and third intensities of the phosphorescent red, blue, and green component emissions producing a white color emission, comprising:

an increased source of the phosphorescent red component emission producing a corresponding increased intensity exceeding the prescribed first intensity thereof, relative to the second and third intensities, required to provide a white color;

a filter selectively attenuating the undesired gaseous red component emission to a visually insignificant level and also attenuating a desired component characteristic of the red phosphorescent component emission by a measurable amount; and

the increased amount of the source of the red phosphorescent component emission being sufficient to compensate for the level of selective attenuation of the red phosphorescent component emission by the filter.

57. (NEW) An improved color display apparatus of the type that performs a gaseous discharge producing an undesired gaseous red component emission, and also produces phosphorescent red, blue, and green component emissions of respective and different peak emission values at corresponding, different wavelengths, respective prescribed first, second, and third intensities of the phosphorescent red, blue, and green component emissions producing a white color emission, wherein the improvement comprises:

a filter selectively attenuating the undesired gaseous red component emission to a visually insignificant level and also attenuating a desired component characteristic of the red phosphorescent component emission by a measurable amount; and

a source of the phosphorescent red component emission constructed to provide an increased intensity exceeding the prescribed first intensity required to provide the white color emission, relative to the second and third intensities, the increased amount of the source of the red phosphorescent component emission being sufficient to compensate for the measurable amount of selective attenuation of the red phosphorescent component emission by the filter, thereby causing the display to emit from the filter the white color emission.